USDA FOREST SERVICE
COLUMBIA RIVER GORGE NATIONAL SCENIC AREA
902 WASCO AVENUE, SUITE 200
HOOD RIVER, OR 97031

Telephone: 541-308-1700
Fax: 541-386-1916

PROJECT REVIEW APPLICATION

DATE OF APPLICATION:

APPLICANT(S)	**PROPERTY OWNERS**
Bonneville Power Administration	Multiple as shown in Wasco & Klickitat County Assessors offices.
Emmanuel Jaramillo, Project Manager	
MAILING ADDRESS	MAILING ADDRESS
PO Box 61409	
Vancouver, WA 98666-1409	
APPLICANT'S SIGNATURE AND DATE	PROPERTY OWNER'S SIGNATURE AND DATE
/s/ Emmaneul Jaramillo 2/27/2013	
PHONE: 360-619-6116	PHONE:
E-MAIL: ejaramillo@bpa.gov	E-MAIL:

LOCATION OF PROPERTY			**PROPERTY ADDRESS** (IF APPLICABLE)
TOWNSHIP: See Attached List	RANGE:	SECTION:	
QUARTER SECTION:		TAX LOT:	
PARCEL SIZE (ACRES):			COUNTY:
EXISTING LAND USE:			STATE:

Application Checklist: the following is required to complete your application:

[x] Application form completed and signed
[x] Site Plan (Photomap Sheets)
[x] Key viewing areas checklist (attached)
[x] Names and addresses of adjacent property owners within 200 feet of parcel (see note)
[x] Any additional information as required:

See attached files:

- Location of Property List
- Final Environmental Impact Statement and Record of Decision (located at this website: ***http://www.bpa.gov/go/BEK***)
- Road Design Details and Grading Plan
- Profiles
- Typical Tower Types
- Footings
- Counterpoise
- Fiber Vaults
- Structure 8/1 Fiber Splice Box Typical
- BNSF Guard Structure Plan
- Bird Diverter Plan
- Klickitat PUD pole design
- Project Facility (new and removal towers, access roads, and workspaces) shapefiles and KMZ files

KEY VIEWING AREAS: Key viewing areas are important public viewpoints and areas that afford opportunities to view the Gorge scenery. Key viewing areas are listed below. Please check those sites which can be seen from your property.

[] Historic Columbia River Highway
[] Sandy River
[] Portland Women's Forum State Park
[] Crown Point
[] Rooster Rock State Park
[] Multnomah Falls
[] Larch Mountain
[**X**] Highway I-84, including rest stops
[] Bonneville Dam Visitor Centers
[] Sherrard Point on Larch Mountain
[**X**] Rowena Plateau/Nature Conservancy Viewpoint
[] Larch Mountain Road
[] Wyeth Bench Road
[] County Road 1230 (Old WA St. Route 14)
[**X**] Washington State Route 14
[] Washington State Route 142
[] Washington State Route 141
[] Cook-Underwood Road
[] Dog Mountain Trail
[] Beacon Rock
[] Cape Horn
[**X**] Columbia River
[] Pacific Crest Trail
Oregon Highway 35

PROJECT SITE PLAN:

Please see photomap sheets and attached project drawings that provide the following information:

[x] Applicant(s) name

[x] Location and width of existing and proposed roads, driveways, and trails

[x] Scale and north arrow

[x] Location and size of existing and proposed structures

[x] Boundaries of parcel with dimensions and size

[x] Location of existing and proposed services including wells or other water supplies, structures, power and telephone poles and lines and outdoor lighting.

[x] Significant terrain features or landforms

[x] Location and depth of all proposed grading and ditching

[x] Groupings and species of trees or other vegetation on the parcel

[x] Location and species of vegetation that will be removed or planted

[x] Water courses and bodies of water

ADJACENT PROPERTY OWNERS AND EXISTING LAND USE
ON ADJACENT PARCELS WITHIN 200 FEET OF PROJECT PROPERTY:

See the Location of Properties attachment for a list of parcels crossed. BPA cannot provide the property owner's names and addresses because BPA is regulated by the Privacy Act of 1974 and DOE Order 206.1, Department of Energy Privacy Program, which prohibit the distribution of Privacy Act protected information unless specifically authorized by law.

At this time, BPA has obtained all necessary land rights to build and construct the portions of the Big Eddy-Knight transmission project described in this application.

TOWNSHIP, RANGE, SECTION, TAX LOT	NAME AND ADDRESS	EXISTING LAND USE

PROJECT DESCRIPTION

The Bonneville Power Administration (BPA) is submitting this application for the portions of the Big Eddy-Knight Transmission Project that will cross the Columbia River Gorge National Scenic Area (NSA). Using mostly existing transmission line corridor, about 2.7 miles[1] of the 500-kilovolt (kV) transmission line will cross the NSA in Wasco County, Oregon and Klickitat County, Washington east of The Dalles, Oregon. BPA prepared a Final Environmental Impact Statement (DOE/EIS-0421, July 2011) that analyzed the impacts of the entire project, including three transmission line alternatives and a no-action alternative. In September 2011, BPA issued a Record of Decision (ROD) describing the selected alternative.

Two Supplement Analyses were conducted in July and November 2012 to determine whether design adjustments and additional cultural resources information were considered substantial changes to the proposal relevant to environmental concerns, such that they would warrant the need for a supplemental EIS. The Supplement Analyses found that the proposed design adjustments do not represent substantial changes to the Big Eddy-Knight Transmission Project that are relevant to previously-identified or new environmental concerns. The environmental documents are available at *http://www.bpa.gov/go/BEK*.

BACKGROUND

BPA is a federal agency within the U.S. Department of Energy that owns and operates more than 15,000 circuit miles of high-voltage transmission lines in the Pacific Northwest. These lines move most of the Northwest's high-voltage power from facilities that generate the power to power users throughout the region and to nearby regions such as Canada and California.

BPA has a statutory obligation to ensure it has sufficient capability to serve its customers through a safe and reliable transmission system. The Federal Columbia River Transmission Act directs BPA to construct improvements, additions, and replacements to its transmission system that the BPA Administrator determines are necessary to provide service to BPA's customers and maintain electrical stability and reliability (16 United States Code [USC] Section [§] 838b[b-d]). If there is not enough available transfer capability on the transmission system to accommodate new transmission requests, new transmission facilities may be proposed subject to appropriate environmental review under the National Environmental Policy Act (NEPA).

Consistent with its Open Access Transmission Tariff, BPA accepts requests for transmission service in a transmission service request queue. In 2008, BPA conducted its first Network Open Season (NOS) marketing process to help manage the requests in this queue and assist in determining where new infrastructure might be needed to accommodate these requests. In order to accommodate long-term firm transmission requests that BPA has received to move power from the east side of the Cascade Mountains (along the Oregon/Washington border) to load centers (such as Portland, Oregon) on the west side of the Cascades, BPA will increase the transfer capability of the 500-kilovolt (kV) transmission system. This power needs to move to load centers west of the Cascades, but there is not sufficient

[1] Portions of the project within the NSA have been previously constructed and are not included in this application. For the purposes of reporting the number of transmission line miles in the NSA, only those portions of the transmission line still requiring work (stringing, removal, and/or construction) at a structure have been included. Note that new towers will not be installed over the entire length reported in the NSA mileage calculations.

transfer capability available on existing transmission lines, specifically along the West of John Day transmission path. Without new transmission facilities, BPA's system would likely become overloaded at certain times of the year, which could cause outages on BPA's and local utilities' transmission service grids.

The Big Eddy-Knight Transmission Project will eliminate an electrical bottleneck in this area, provide an additional electrical pathway, and increase the system transfer capability to accommodate the requested transmission service and allow additional power to flow through the region. In addition, the project will benefit the operation of BPA's transmission system by helping redistribute the flow of power, which will increase the capacity of the overall system providing a stronger year-round power source for the Portland, Oregon load service area. The project is consistent with long-range system plans and will defer the need for future reinforcement projects that would be needed in its absence.

BPA submitted a consistency review application to the US Forest Service (USFS) on September 30, 2011. At the time of review, the project was found to be consistent with the NSA act and management plan as documented in the USFS Consistency Determination dated November 22, 2011. After the initial Consistency Determination, BPA submitted six amendment applications to reflect project design changes. The original Consistency Determination (CRGNSA CD-11-10-G) expired two years after the issuance of the determination (November 22, 2013). At the time of application, BPA anticipated that project construction would be completed within this timeframe.

BPA began construction of the project in non-NSA areas following issuance of the project's ROD in September 2011. Construction within the NSA commenced after the completion of the USFS' consistency review. Due to unforeseen construction delays, as described further in the Cultural Resources section below, the project was not fully implemented before the November 22, 2013 Consistency Determination expiration.

Because a new Consistency Determination is required for the portions of the project that still require construction within the NSA, BPA is submitting a new application for USFS review. This application only addresses those portions of the project work that remain within the NSA. It is important to note that due to the reconfiguration of the project to minimize impacts to cultural resources, the scope of the proposed construction activities are reduced from those that were originally found to be consistent with the NSA act and management plan in 2011.

PUBLIC INVOLEMENT

During the scoping period for the Big Eddy-Knight Transmission Project EIS (summer 2009), BPA solicited comments from the public; Tribes; federal, state, regional, and local agencies; interest groups; and others to help determine what issues should be studied. Comments were requested by publishing notices in the Federal Register; mailing a letter to about 400 potentially interested and affected persons; holding two public open-house style meetings; placing ads in and sending press releases to local media about the comment period and public meetings; and meeting with Tribes, state agencies, congressional, county and city staffs, and interest groups. Comments received were posted on the project's Web site, which provided additional information and other means for providing comments.

Based on initial public comments from more than 400 people and additional studies of the transmission system, BPA refined the proposed transmission line routing alternatives. In December

2009, BPA mailed the public a factsheet that described the refinements and requested more comments. In December 2010, BPA distributed the draft EIS to the public (landowners, Tribes, federal, state, regional, and local agencies, interest groups and others) for review and comment. The comment period for the draft EIS officially began on December 10, 2010 with publication of a draft EIS Notice of Availability in the Federal Register (Volume 75, No. 237), and closed on January 28, 2011. About 400 people commented on the draft EIS via comment forms, the project website, during public meetings, emails, phone messages, and/or letters.

The final EIS addressed comments received on the draft EIS. BPA made the final EIS available to the public, and sent it to interested parties. A Notice of Availability of the final EIS was published in the Federal Register (Volume 76, No 136) on July 15, 2011. BPA released a ROD on the project on September 16, 2011. The public was notified of the ROD through direct mailings, BPA's website and media releases. A Notice of Availability of the ROD was published in the Federal Register (Volume 76, No 186) on September 26, 2011.

DESCRIPTION OF PROJECT FACILITIES AND ACTIVITIES IN THE NSA

The project work that will occur within the NSA includes removal of an existing transmission line, construction of a new 500-kV double-circuit transmission line (with fiber optic cable) that can carry both the existing line and the new line, and construction, repair, and maintenance of access roads. About 2.7 miles of the transmission line will cross the NSA, mostly in existing transmission line corridor through an area designated as General Management Area (GMA). The line will cross three areas: Urban Areas, Bureau of Indian Affairs (BIA) land, and GMA Large-Scale Agriculture land use (as designated in the NSA management plan)(see Table 1). Because Urban Areas and BIA lands are exempt from provisions of the Scenic Act, this application will focus on the facilities proposed within the land designated as Large-Scale Agriculture.

Table 1. NSA Lands Crossed by the Transmission Line and Access Roads

	Transmission Line							Access Roads[d]		
Land Type	Transmission Line Length (miles)	Replacement Transmission Towers (number)[a]	New Transmission Towers (number)	Removed Transmission Towers (number)[b]	Workspace at Transmission Towers (number)[c]	Total Permanent Disturbance Area (acre)	Total Temporary Disturbance Area (acre)[e]	New Roads (acre)	Repair Roads (acre)	Maintain Roads (acre)
Urban Areas	0.3	1	0	0	0	0.2	0.5	0.1	0.2	0.3
Bureau of Indian Affairs	0.4	1	1	0	1	0.3	3.4	0	0	0
Large-Scale Agriculture NSA Land Use Designation	2.0	3	1	3	3	0.7	8.4	4.1	3.3	0.9

Source: Management Plan with revisions 2004, amendments through June 2007

[a] Location where new towers will be placed in nearly the same place as the removed tower.

[b] Includes those towers that will be removed from a location significantly different than the location of the new towers. The removal structures include temporary structures on the Oregon side of the river crossing.

[c] Includes previously-constructed towers that will require workspaces for stringing/pulling activities. All other towers that will require workspace for construction or removal are accounted for in other columns.

[d] Routes of travel that use existing roads or cross agricultural fields are not included in this table as these roads will likely not result in new road infrastructure. Routes of travel are quantified further in the Access Road subsection.

[e] Stringing areas and tensioning sites are included in the temporary disturbance areas.

At about line mile 7 (in Oregon), work will resume in the NSA before crossing over the Columbia River west of the Burlington Northern Santa Fe (BNSF) railroad bridge toward Wishram, Washington. The line will cross Large-Scale Agriculture lands on the Oregon and Washington sides of the Columbia River Crossing (river crossing) before entering the Urban Area of Wishram. The line then continues north over State Route (SR) 14 onto BIA land.

From the river crossing to Wishram, the existing Harvalum-Big Eddy 230-kV line will be removed and rebuilt with double-circuit 500-kV towers that will carry both the Harvalum-Big Eddy 230-kV line and the new Big Eddy-Knight 500-kV line. The line will be built within BPA's right-of-way easement for the Harvalum-Big Eddy line.

At line mile 10 the line intersects with the existing BPA McNary-Ross 345-kV line north of Wishram, Washington. The remainder of the Big Eddy-Knight line northeast of this intersection has been constructed or is outside of the NSA and is not included in this application.

Project Components

Towers

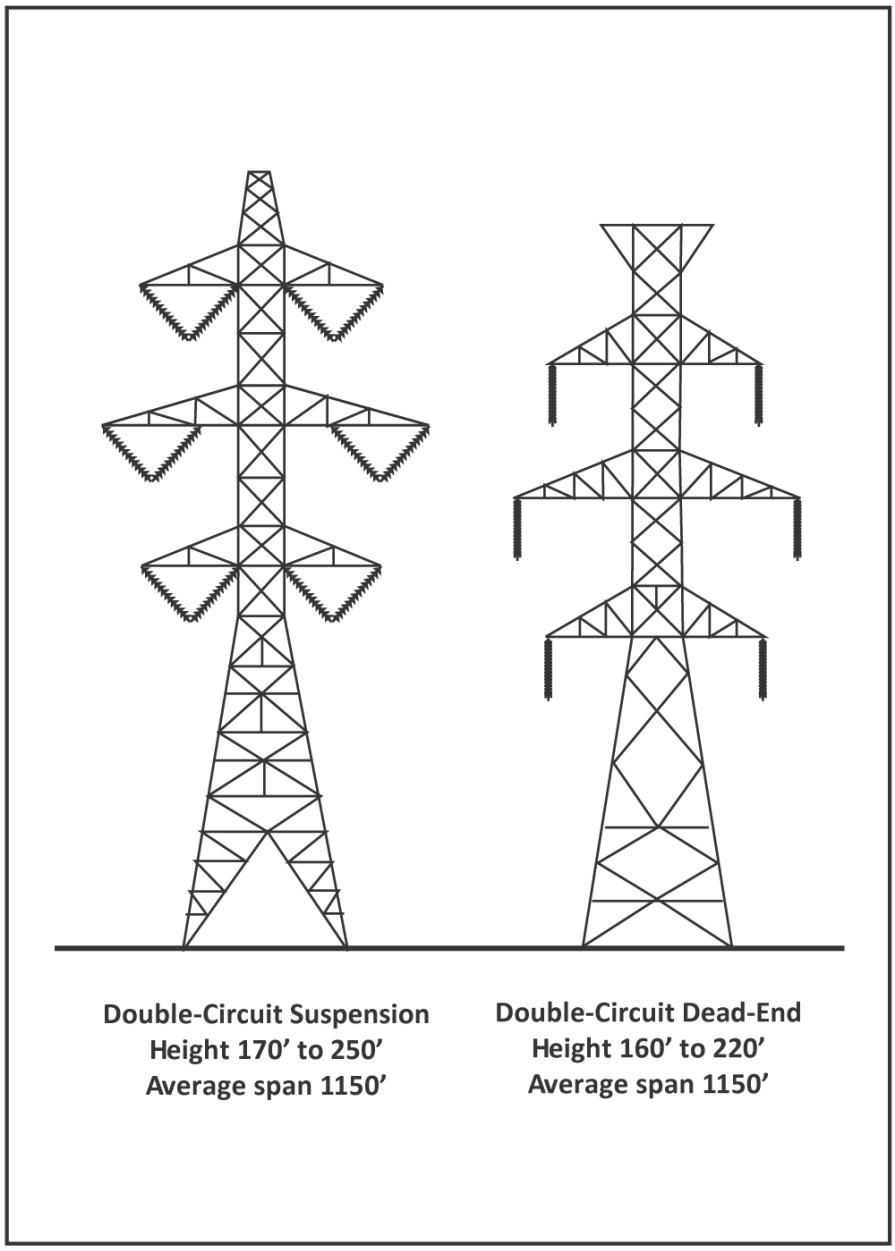
Double-circuit 500-kV lattice steel towers will be used to support the conductors, ground wires, and fiber optic cables (see Figure 1 and the Typical Tower Types attachment). Table 2 contains a summary of the proposed tower activities within the NSA. The new tower heights will be less than 237 feet, depending on the terrain, vegetation, and road and river crossings. Spans between individual towers will generally be about 1,150 feet, with about five towers needed for each mile of line. Towers will be made of dulled, galvanized steel. Each tower has a tower number assigned for the line mile and tower number within that mile; for example, Tower 2/4 is the forth tower in mile 2.

Two temporary wood pole structures (temporary Towers 7/2 and 7/3) were installed on the Oregon side of the river crossing to provide a temporary electrical connection between the constructed portion of the Big Eddy-Knight line and the existing Harvalum-Big Eddy line due to the unforeseen construction delays between line miles 8 and 10. The temporary wood structures are comprised of three poles with associated guy wires and plate anchors. During upcoming construction activities, these temporary structures will be fully removed as the conductor is installed between the new Big Eddy-Knight structures in line miles 8 through 10. All structure components (poles, anchors, guy wires) will be removed and the disturbance area will be restored to pre-project condition. The existing river crossing Tower 17/1 will also be retired once the conductors have been removed. The existing foundations of Tower 17/1 will be removed approximately two feet below the ground line.

The towers on either side of the Columbia River are unique designs. The previously constructed Tower 7/5 on the Oregon side is 408 feet tall. Tower 8/1 on the Washington side still requires construction and will be 243 feet tall. The conductor between the towers will span over the river for approximately 4,700 feet. For aircraft safety, these towers will be lighted as required by the Federal Aviation Administration (FAA) (see Figure 2). The lighting on Towers 7/5 and 8/1 will require three day/night warning lights. The lights will flash white during the day and red at night. The lights will flash in a sequence – middle, top, bottom. The lighting will be angled and partially shielded to minimize visual impacts to landowners and others on the ground. Bird diverters will be installed on the overhead

ground wires with a thirty-foot separation on each wire and a staggered fifteen foot offset between diverters on each of the two ground wires. No towers will require painting.

Figure 1. Typical Double-Circuit 500-kV Lattice Steel Towers



The new river crossing Tower 8/1 on the Washington side of the Columbia River requires utility service to power the river crossing beacons. The existing 230-kV river crossing dead-end tower has utility service and once the existing tower is removed, the new Tower 8/1 will be installed 20 feet north of the existing tower location. The existing utility service can be used for the new lights; however a new meter pole must be installed between Klickitat Public Utility Department's (PUD) existing pole at the existing tower and BPA's new Tower 8/1 to meet current standards. The new meter pole will be approximately 45 feet in length and will require one guy wire to support the pole. The pole and guy will be buried approximately 5 to 7 feet deep (see Klickitat PUD Pole Design attachment). BPA will own the meter pole and overhead wire within the existing transmission right-of-way.

Table 2. New and Removal Transmission Towers in the NSA[a]

	New Towers		Towers for Removal	
Tower #	**Type**	**Tower Height (ft)**	**Tower Height (ft)**	**New and Old Tower Approximate Offset (ft)**
Temp 7/3[b]	T53WF-WSH	None to be constructed	85	N/A
Temp 7/2[b]	T53WF-WSH	None to be constructed	95	N/A
17/1[c]	N/A	None to be constructed	180	N/A
8/1	S159D	237	191	28
Klickitat PUD utility pole[d]	N/A	45	No Tower	N/A
9/1	39M	190	No Tower	N/A
9/2	39M	165	93	14
9/3	39M	175	83	13
9/4	39B	195	83	55
9/5	39A	199.0	No Tower	N/A
10/1	139D	194	104	107

[a] Double line breaks in the table indicate areas where the line exits the NSA or enters urban or BIA lands (which are excluded).
[b] This temporary structure has been previously constructed. The only activity at this site will be to remove the temporary structure, guy wires, and guy wire anchors.
[c] This tower is part of the Harvalum-Big Eddy line and will be removed after the Big Eddy- Knight structures are completed.
[d] Klickitat PUD utility pole and guy will be installed near Tower 8/1.

Footings

Two different types of tower footings will be used to securely anchor the transmission towers in the ground: 1.) Grillage footings (used for double-circuit towers in most soil types), and 2.) Concrete shaft footings (used for the river crossing tower). The grillage footings will be buried up to 16 feet deep, permanently occupy an area of about 0.17 acre, and temporarily disturb about 0.69 acre. The soil excavated for the grillage footings will be used to backfill the holes. The river crossing Tower 8/1 will have concrete shaft footings, which will be buried 33 feet deep and have a diameter of 8 feet. The concrete shaft footings will extend above the ground line for a maximum of 9 feet. Controlled blasting is necessary in hard rock to fracture the rock making it easier to excavate. Blasting will be used for both grillage and concrete shaft footings where rock is encountered that cannot be excavated with machinery. Blasting at Tower 8/1 has been reviewed to ensure that no impacts to nearby cultural resources will occur. After excavation, the soil removed for concrete shaft footings will either be spread out onto an approved location or removed from the project area. See Table 3 and the Footings attachment for additional footing and general blasting details.

In areas where the existing Harvalum-Big Eddy line will be removed, the existing tower footings will be cut-off two feet below ground. If the existing footings interfere with construction of the new line, they will be removed and the excavation will disturb about 0.43 acre. There are approximately four footings that will overlap with new tower footings. Two footings at Tower 9/2 and two footings at Tower 9/3 will be fully excavated to install the new structures. Eight grillage footings have been previously constructed for Towers 9/5 and 10/1. No additional footings will be constructed for these structures.

Figure 2. Columbia River Crossing Tower

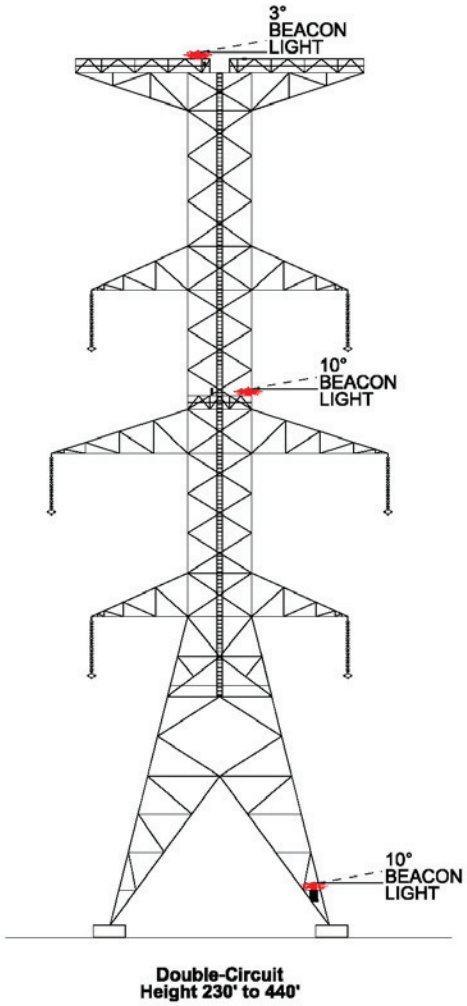


Table 3. Approximate Typical Disturbance Areas for Double-Circuit Tower Installation

Types of Disturbance	Typical Disturbance Area for Double-Circuit 500-kV (acre)
Permanent tower footprint	0.17
Temporary disturbance during tower construction	0.52
Standard counterpoise disturbance [a]	0.04
Tensioning site	0.46

The temporary tower construction disturbance are typically includes the counterpoise disturbance areas.

Conductor

The towers will carry six sets (called phases) of conductors arranged in a stacked design (see Figure 3). Each phase will consist of a bundle of three, 1.3-inch diameter conductors held together by spacers about 20 inches apart. From a distance, a bundle looks like a single wire. The conductors will be attached to the towers using insulators. Insulators are bell-shaped devices that prevent electricity from jumping from the conductors to the tower and going to the ground. Insulators are made of porcelain and are non-reflective. The height of the conductor will meet or exceed National Electrical Safety Code clearance requirements and will be at least 29 feet above the ground, 45.5 feet above highways, and maybe higher depending on other clearances (railroads, rivers, etc.).

During the removal of the existing wires and the installation of the new wires, temporary guard structures will need to be installed on either side of the railroads, foreign utilities, and roadways. This is a safety precaution in the unfortunate event the wires fall during removal or installation. The guard structures will help keep the wires off the infrastructure so that they are not significantly affected should the wire fall. The typical guard structure will consist of two to three 65-foot wood poles buried 8.5 feet below ground with a series for wood poles hung horizontally. At this time, guard structures are expected in the span between Towers 9/4 and 9/5 and at the BNSF railroad tracks, as described further below. All guard structures will be removed at the end of construction and ground disturbance areas will be restored.

The guard structures placed near the BNSF railroad tracks will have a different design to minimize impacts to cultural resources. After a series of designs, BPA has developed a revised guard structure plan that will result in reduced disturbance. The guard structures will consist of seven poles on each side of the railroad bed. An auger will be used to install each pole and horizontal cross poles will be installed approximately 30 feet above the railroad bed. See the BNSF Guard Structure Plan attachment for additional details.

BPA may use a mobile guard structure utilizing the railway for removal of the three existing conductors over the BNSF railroad tracks. This would require placing two cranes on flat bed rail cars, one crane on each car, and driving the rail cars on the tracks from Wishram Station to a location under the existing conductor. The cranes would then lift each end of a horizontal crossbar, likely a wood pole, approximately 30 feet in the air to protect the adjacent railroad tracks. If a train needs to pass on the tracks, the conductor removal process would stop and the mobile guard structure would travel back to

the Wishram Station to allow the train to pass. Once the train has passed, the mobile guard structure would then travel back to the site and the conductor removal process would resume. Use of the mobile guard structure would take careful coordination and support from BNSF. This mobile guard structure proposal is currently being reviewed. Use of a mobile guard structure will not be feasible during stringing of the new line because of the increased number of cables.

BPA will not start construction on any BNSF guard structures or use the associated routes of travel for the guard structures until the sensitive cultural resource issues related to the BNFS railway are addressed.

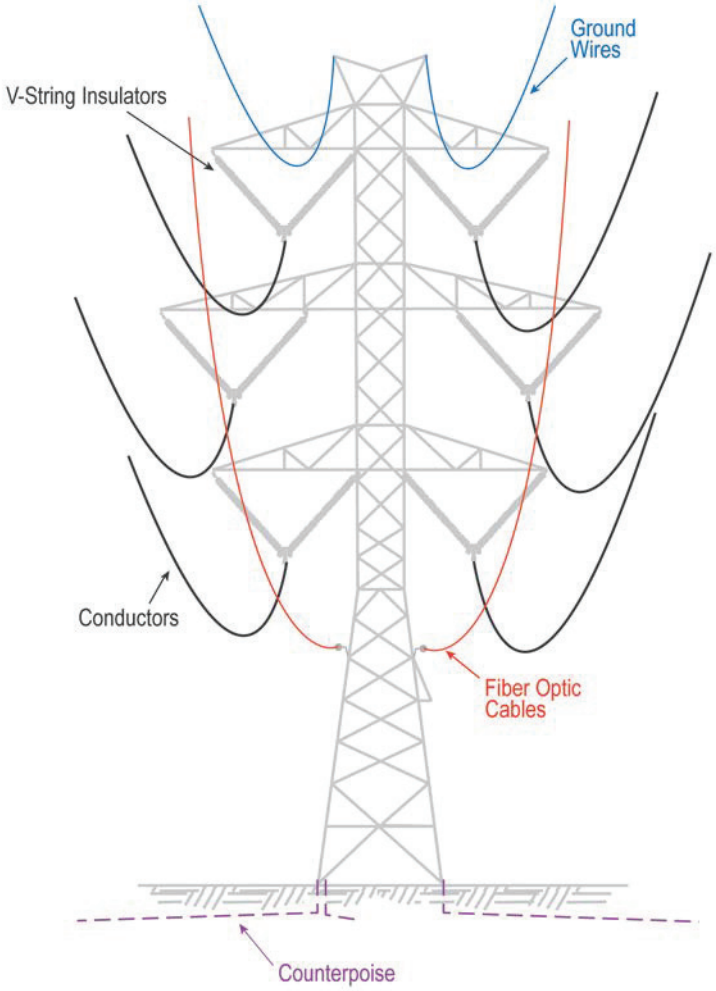
All guard structures, including the BNSF guard structures, will be removed after construction and the disturbance area will be restored. The guard structures will all be located within BPA's transmission right-of-way.

Overhead Ground Wire

Two small wires (0.5-inch diameter), called overhead ground wires, will be attached to the top of the transmission towers (see Figure 3). Ground wires are used for lightning protection and will take the lightning charge instead of the conductors. Between the towers that cross the Columbia River, the fiber optic cable (see Fiber Optic Cable) that will be installed will also act as the overhead ground wire.

Bird diverters will be installed on the ground wires crossing the Columbia River. Bird diverters will be yellow with a visible diameter of 4.25 inches at the coil and will be spaced approximately thirty feet apart on each ground wire (see Bird Diverter Plan attachment). The diverters will be staggered between the two ground wires at a 15-foot interval.

Figure 3. Components on a Transmission Tower

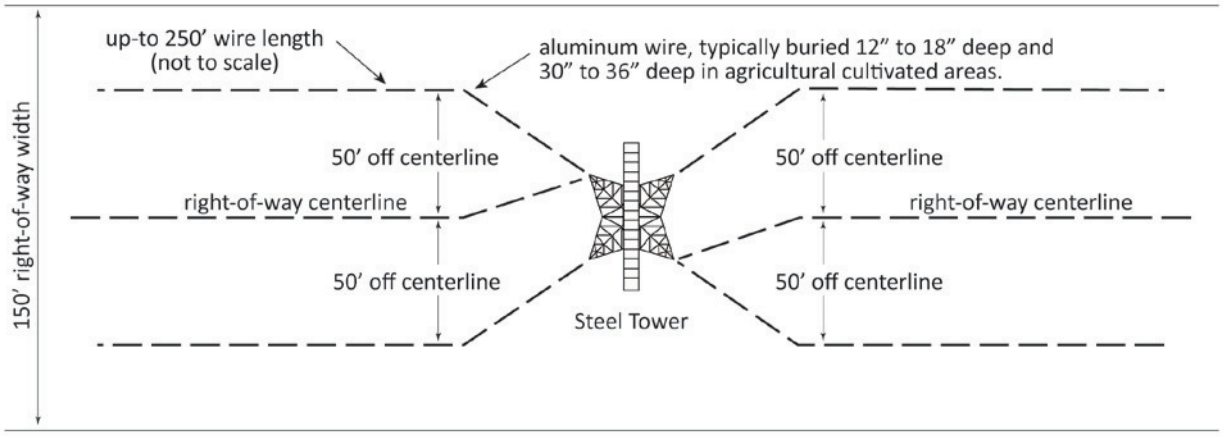


DOUBLE-CIRCUIT TOWER

Counterpoise

To take the lightning charge from the overhead ground wire and dissipate it into the earth, a series of wires called counterpoise will be buried in the ground at the base of the towers and within the transmission line right-of-way (see Figure 4 and Table 3). Counterpoise will be needed at three towers (Towers 8/1, 9/4, and 9/5) (see the Counterpoise attachment) based on the soil types present. The design for Towers 9/4 and 9/5) consists of four aluminum wires (3/8-inch in diameter) buried 50 feet from the tower: two wires back and two wires ahead. The wire is buried 12 to 18 inches deep. The two wires will run at a 45-degree angle away from each side of the tower, then turn and run within the right-of-way at a distance of 50 feet off centerline. Where there are obstructions, buried utilities, or environmentally sensitive areas, the counterpoise design will be changed to avoid these areas. The counterpoise design at Tower 8/1 has been modified to lessen ground disturbance. The aluminum wires will be coiled around the concrete shaft footing within the shaft excavation area approximately 12 inches below ground at all four footings.

Figure 4. Typical Overhead View of Counterpoise



Fiber Optic Cable

The transmission line will also carry a fiber optic cable (see Figure 3). Fiber optic cable will provide communication links for the transmission system, allowing voice communications between power dispatchers and line maintenance crews, and providing instantaneous commands that control power system operation.

The fiber optic cable will be less than 1 inch in diameter and will be mounted under and/or between the conductors. Every 3-5 miles there will be a splice box/reeling location to string and then put tension on the fiber optic cable (see the Fiber Optic attachment). The splice box will be about 22 inches by 8.5 inches by 6 inches and will be installed in a 4-ft by 4-ft by 4-ft concrete vault in the ground between the tower legs. The splice location at Tower 8/1 will be installed on the tower in a splice enclosure to avoid additional ground disturbance in the sensitive area (see the 8/1 Fiber Splice Box attachment).

Pulling and Tensioning Sites

Pulling and tensioning sites are areas used for pulling and installing the conductor, groundwire, and fiber optic cable on the transmission towers. These sites need to be located directly behind the towers so the wires can be pulled through the towers in a straight line. The wires must maintain a minimum slope of 2:1 (length:height) from where the wire attaches onto the tower down to the stringing/pulling equipment as it is installed. This means that the highest wire attachment location on the tower (groundwire) governs the pulling site. If the wire attachment is 100 feet above ground, the equipment must be located a minimum of 200 feet away from the tower. In general, a wire slope of 3:1 (length:height) is preferred because it provides an extra factor of safety. The pulling and tensioning sites needs to be level, so some grading may be required in certain locations.

Within the NSA, four pulling/stringing sites will be needed for the conductor, groundwire and fiber optic cable. The pulling site at Tower 7/4 will use a flat area within the existing right-of-way. It will be approximately 100 feet wide by 300 feet long without any anticipated grading (about 0.75 acre). The pulling site at Tower 8/1 will have an irregular dimension as it was designed to minimize potential impacts to sensitive resources. At Towers 10/1 and 10/2, the pulling sites will be located within the existing BPA right-of-way. The dimensions will be approximately 100 feet by 200 feet. Tower 10/1 will have a pulling site back and ahead of the new tower. Tower 10/2 pulling site will be located to northwest of the Tower 10/2. The workspaces associated with pulling/stringing sites are depicted in the Photomap attachment. Depending on conditions, the sites could be graded, graveled with crushed

rock that includes some fines, and reseeded, or a combination of these activities. The pulling may require temporary "snubs," which will consist of the use of a bulldozer from which the stringing lines and equipment will be temporarily anchored. The final pulling plans developed by the contractor will determine the need for snubs at the pulling sites.

While not a pulling/stringing work area, additional work area will be required at Tower 7/5 to attach the conductor to the previously-constructed tower.

Staging Areas

The staging area/ material yard for the project is located in Dallesport, Washington on airport property within the Urban area of the NSA. No other staging areas are planned inside the NSA.

Access Roads

About 9.0 miles of access roads will be needed for the project within the NSA, though a majority of the roads are already established for the existing transmission line corridor. Based on the definitions in the Management Plan, road work falls into three categories; new construction, repair, and maintenance (see definitions below). For this project there will be 0.7 miles of new construction, 1.5 miles of repair, and 0.5 miles of road maintenance. In addition, BPA has a definition for Direction of Travel roads, which are either existing county, public, or private roads, are temporary crossings of agricultural fields, or are the use of existing railroad tracks. There will be about 6.2 miles of Direction of Travel roads. Further, BPA will use 0.9 mile railroad as an additional Direction of Travel to facilitate the installation of guard structures on the south side of the railroad tracks. See the attached Photomap sheets and Table 4 for road types, actions, and locations that are depicted on the photomaps. The photomap sheet legend shows the road types described above, as well as current federal access road easements and easements to be acquired.

Existing access road conditions vary greatly depending on their location within the gorge, adjacent terrain, annual use, and annual maintenance of the roads. Existing roads are currently accessible by a 4 wheel drive pick-up truck and have been accessed within the last year. Existing road repair/maintenance is required to return the roads to their original condition due to adjacent erosion issues and inadequate road surfacing to support tower construction activities and future maintenance of the transmission line. See Road Designs attachment.

Access Road Repair, as shown on the attached photomap sheets (solid red lines), will involve grading the access road to meet BPA standards, additional access road surfacing/sub-base, and addressing drainage issues. Adjustments to cut and fill slopes will be necessary in line mile 9 to meet BPA standards due to degradation of existing access roads. The photomap sheets show the locations of new culverts, fords, gates, cattle guards, drain drips, and waterbars.

Access Road Maintenance, as shown on the attached photomap sheets (dashed red lines), will involve blading and reshaping the existing roadbed to meet BPA standards, additional access road surfacing/sub-base, and addressing drainage issues. The access roads will not be widened, but the road and road shoulder may be graded and graveled where adjacent vegetation has encroached on the road. Adjustments to cut and fill slopes may be necessary to meet BPA standards due to degradation of existing access road. The photomap sheets show the locations of new culverts, fords, gates, cattle guards, drain drips, and waterbars.

Repair is defined in the management plan as: "Replacement or reconstruction of a part of a serviceable structure after damage, decay or wear. A repair returns a structure to its original and previously authorized and undamaged condition. It does not change the original size, scope, configuration or design of a structure, nor does it excavate beyond the depth of the original structure. Repair includes, but is not limited to, reroofing a building, replacing damaged guardrails, reconstructing a rotten deck or porch, replacing a broken window or door, replacing a utility pole and associated anchors, replacing a section of broken water or sewer line, replacing a damaged or defective utility line, reconstructing a portion of a building damaged by fire or a natural event, and replacing railroad ties or rails." (MP, G-14).

Maintenance is defined in the management plan as: "Ordinary upkeep or preservation of a serviceable structure affected by wear or natural elements. Maintenance does not change the original size, scope, configuration or design of a structure. Maintenance includes, but is not limited to, painting and refinishing, re-grouting masonry, patching roofs, grading gravel roads and road shoulders, cleaning and armoring ditches and culverts, filling potholes, controlling vegetation within rights-of-way, removing trees and other roadside hazards within rights-of-way, and testing and treating utility poles." (MP, G-12).

New Road Construction, as shown on the attached photomap sheets (solid purple line), are spur roads from existing access roads to specific towers (9/1, 9/2, 9/4) within the Large-Scale Agriculture (9/1 and 9/2) and Urban (9/4) areas of the NSA. Grading plans are required for new construction unless the cumulative grading is 200 cubic yards in areas with a slope less than 10 percent or grading is less than 100 cubic yards in areas with a slope greater than 10 percent. The cumulative grading for spur road 9030 that leads to Tower 9/4 is less than 200 cubic yards and the slope is less than 10 percent. Spur road 9010 that lead to towers 9/1 and 9/2 will require grading greater than 200 cubic yards. Therefore, the attached grading plan includes the plan for spur road 9010. The photomap sheets show the locations of new culverts, fords, gates, cattle guards, drain drips, and waterbars.

Direction of Travel, as shown on the attached photomap sheets (dashed white and black line), is either an existing road that will be used to access the project, is a temporary agricultural field crossing, or is an existing railroad that will be temporarily used to access project work areas. Cumulatively, the project will use approximately 1,500 feet of route of travel across agricultural fields, 31,200 feet (5.9 miles) of route of travel on existing roads, and 4,800 feet of railroad route of travel. The existing roads may need repair after construction activities if construction results in damage to the road bed. Post construction repairs may include replacing gravel or minor blading to return the road to pre-construction condition.

Direction of travel could require the installation of gates (in farm fencing in order to access the field), and the placement of culverts or fords). If a culvert or fence is needed (such as where the road would adjoin the county road), those features will be left in place for possible future use to access the tower. The photomap sheets show the locations of new culverts, fords, and gates.

The temporary use of the BNSF railroad would be used to facilitate the installation of the southern BNSF guard structure, as described further under the 'Conductor' subsection above and in the BNSF Guard Structure Plan attachment. If the existing railroad were not used for guard structure installation, the project would have no access to the south side of the railroad tracks to facilitate guard structure installation. Approximately 600 feet of the BNSF guard structure route of travel will potentially require the addition of gravel for use of the road (see the BNSF guard structure plan attachment). The

remainder of the route of travel leading to the BNSF guard structure will be used in its current condition. The BNSF would resume control of the routes of travel in the guard structure area at the completion of construction.

The direction of travel leading to Tower 9/3 is an existing road that will be used for construction. Depending on the road condition at the time of use, gravel may be added to the road bed to facilitate use. At this time, gravel addition is not anticipated, but there is a possibility if contractors encounter wet conditions that gravel may be necessary in limited areas. The two routes of travel potentially requiring gravel are denoted on the Photomap attachment. No additional routes of travel will require modification for use.

Table 4. Access Road Construction, Repair, and Maintenance Actions by Photomap Sheet

Map Sheet	Construction	Repair	Mainteance	Temporary Road	Direction of Travel	Subgrade Stavilization	Culvert Install	Rubber Waterbar	Rock Waterbar	Rolling Drain Dip	Ford	Ditch Construction	Lead Off Ditch	Stockyard Gate	Barbwire Gate	Isolation Fence Panel	Access Road Approach
6					x												
7					x												
8																	
9	x	x	x		x		x		x	x				x		x	
10					x												
11					x												

PROJECT SCHEDULE AND EQUIPMENT

Construction is proposed to resume in June 2014 with preparation work such as access roads, guard structures, and site preparation. Transmission line construction needs to occur while the Harvalum-Big Eddy line is taken out of service and de-energized so that the existing line may be removed. The Harvalum-Big Eddy line is a critical component of BPA's system to provide electrical service to the Portland/Vancouver metro area and other load centers. Therefore, a continuous outage that extends beyond the planned duration would potentially disrupt power service to Portland/Vancouver and other currently planned projects or maintenance. The work during the planned outage is scheduled to extend from July 1, 2014 to December 30, 2014. Overall, construction is expected to continue for approximately 6 to 8 months.

The contractor will utilize many different types of equipment through out the course of construction schedule. The following equipment is expected, but not limited, to be used for access roads, foundation removal, and foundation installation:

1. Pick-up and flatbed trucks to transport workers, materials, and tools,
2. CAT excavators to remove soil,
3. Lo Drill to auger for drilled shaft footings,
4. Loader to move soil around,

5. Grader and dozer for access roads,
6. Compaction roller for access roads
7. Dump trucks for transporting soil and rock,
8. Forklift for maneuvering steel,
9. Water trucks to keep dust to a minimum, fire prevention, and compaction,
10. Trench boxes for working in open excavation,
11. Compactors for compacting soil around footings, and
12. Rock hammer to remove rock during excavation.

The following equipment is expected, but not limited, to be used for tower removal and installation:

1. Pick-up and flatbed trucks to transport workers, materials, and tools,
2. Water trucks to keep dust to a minimum and fire prevention,
3. 200 Ton crane to lift tower sections in place,
4. Fork lifts for maneuvering steel,
5. Crane trucks with man baskets for lifting small equipment working off the ground, and
6. Air compressors to torque tower bolts.

The following equipment is expected, but not limited, to be used for wire removal and installation (i.e. stringing/pulling):

1. Pick-up and flatbed trucks to transport workers, materials, and tools,
2. Puller to pull wire through the tower from the wire reels,
3. Tensioner to assist the puller to keep tension on the wires and off the ground,
4. Tractor and trailer to transport the wire reels,
5. Caterpillar bulldozer to help anchor (snub) the wire during installation,
6. Helicopter to fly nylon rope to each tower used to pull wire,
7. Crane trucks with man baskets for lifting small equipment working off the ground, and
8. Air compressor to install wire fittings.

RECLAMATION

Approximately 2.1 miles of existing tower and conductor will need to be removed to accommodate the Big Eddy – Knight Transmission line within the NSA. Dismantled steel and conductor will be salvaged and recycled. After the towers are removed most of the existing footings will remain in place with the legs being cut at a minimum of 2 feet below ground level (unless otherwise directed by the landowner). Within the NSA, approximately two towers will each have two footings excavated and removed because they interfere with the new tower footing installation. The two temporary wood-pole structures and associated guys, anchors, and conductors in line mile 7 will be completely removed. No components associated with the temporary structures will remain after the project completion. Disturbed areas will be restored to be consistent with the surrounding topography and seeded.

LARGE-SCALE AGRICULTURE

Locating new utilities within large-scale agriculture requires certain conditions be met for consistency with that designation. New utility facilities necessary for public service may be allowed subject to compliance with Management Plan guidelines for the protection of scenic, cultural, natural, and recreation resources and upon a showing that (1) there is no practicable alternative location with less

adverse effect on agricultural lands, and (2) the size is the minimum necessary to provide the service (Management Plan, page ll-1-12).

Replacing existing aboveground overhead utility facilities is allowed outright within large-scale agriculture if the replacement facilities would have the same location and size as the existing facilities and consist of the same or other appropriate building materials as the existing facilities (Management Plan, pages ll-7-14 and II-7-15). Expedited review of replacement facilities is also available, provided that the replacement facilities would be in the same location as and no more than 15 percent larger than the physical size of the existing facilities (Management Plan, page ll-7-22) and meet buffer requirements for sensitive wildlife areas and plants (Management Plan, pages ll-7-24 and II-7- 25). Replacement facilities more than 15 percent larger than the physical size of the existing facilities would be considered a "review use" under the Management Plan and reviewed accordingly (Management Plan, pages ll-7-58 through II-7-61).

Through the Large-Scale Agricultural area, the project will mostly impact rangeland with a slight impact on non-irrigated agricultural land. Although tower footprints and access roads will remove acreage from cropland and grazing, the line will generally be compatible because livestock will still be able to maneuver around the towers, within the right-of-way, and along roads to access their range, and farming can still take place within the right-of-way. Because the project will use existing transmission line corridor and access roads, consolidate transmission lines onto one set of towers, and will continue to allow the existing range land and agricultural use to occur, the project will have the least adverse effect on agricultural lands possible.

The proposed 500-kV line is the minimum kilovolt size necessary to meet the proposed project need. Using double-circuit towers will consolidate the new and existing lines onto one set of towers, reducing the overall utility footprint. In addition, the double-circuit towers will allow, at some point in the future, the possible upgrade of the lower voltage Harvalum-Big Eddy line to a 500-kV line without needing to install additional structures along the Columbia Hills, across the Columbia River, and into Big Eddy Substation. Although there are no present plans for a line upgrade, using the double-circuit 500-kV towers at this time would reduce future environmental impacts should an upgrade become necessary.

SCENIC RESOURCES

For scenic resources, the goal of the Management Plan is to emphasize protection and enhancement of Columbia River Gorge landscapes seen from key viewing areas. New utility transmission lines shall be visually subordinate as seen from key viewing areas to the maximum extent practicable (Management Plan, page I-1-6).

"New main lines on lands visible from key viewing areas for the transmission of electricity…shall be built in existing transmission corridors unless it can be demonstrated that use of existing corridors is not practicable. Such new lines shall be underground as a first preference unless it can be demonstrated to be impracticable" (Management Plan, page I-1-10).

The portion of the line still requiring construction in the NSA will be built in existing transmission corridors, and even more importantly, will combine the existing and new lines on the same transmission towers.

Unlike lower-voltage distribution cables used to deliver power to individual homes, it is impracticable to underground high-voltage transmission cables. For a 500-kV line, three individual cables would have to be manufactured and installed at a cost about 10 times the cost of an overhead design. In addition, the costs of maintaining an underground high-voltage line is much greater and more difficult, and the environmental impacts are typically greater than impacts from an overhead line.

Underground cables would require three separate continuous concrete encased ducts along the line route to carry the conductors. The ducts would be in trenches dug a minimum of 4 feet wide and 6 to 10 feet deep for the cables. The separate trenches would be needed for each phase to allow for adequate heat dissipation. Every 1,500 to 1,800 feet a 30-foot long, 10-foot deep manhole is installed to allow for splicing and racking the cables. Undergrounding would impact the entire path of the line (compared to overhead lines which can span sensitive resources such as streams and rivers, wetlands, cultural resources, deep ravines, agricultural fields, etc.). An underground crossing of the Columba River would require hydraulic directional drilling, with temporary 800 square foot exit and entry pits, the use drilling fluid and risk of fractures, and a 4 to 5-acre transition station on either side of the crossing. A permanent cleared corridor between 40 and 100-feet wide would be required, with a continuous parallel access road along the underground line route in order maintain and repair of the cables. Because the cables will be buried, it will be much more difficult to locate failed or damaged cables, and service likely will take weeks or months to restore compared to the hours or days it takes to restore service on an overhead line.

In addition, underground cable systems suffer system losses much higher than those experienced with overhead transmission line systems. There has been no experience in the world with installing the type of underground line for the length needed for the Big Eddy-Knight Transmission Project. With only a few installations throughout the world, underground cable systems have not proven themselves to maintain the high reliability demands of today's electric grids.

The key viewing areas visible from the project are, I-84, SR-14, the Columbia River, and to a much lesser extent Rowena Plateau. Views from Rowena Plateau will be from such a distance that the transmission line will not be discernable in the landscape.

Motorists on I-84 will likely see towers in the background on the Washington side of the Columbia River as they look north; westbound traffic will have middle to background views of the larger river crossing tower in Oregon on the bluff above I-84, but because of terrain, eastbound traffic will not see towers on the Oregon side.

Viewers on SR-14 looking south will have background views of the line on the Oregon side and as it crosses the river toward Wishram. Viewers will pass close to towers where the highway runs under the line and will have brief foreground and middle ground views of the line. The tower on the north side of the SR-14 crossing will be the most dominant. Although this tower is located on BIA land, BPA considered design options to move the tower further from SR-14, but given the terrain the tower will then have been much taller and will have required lighting for aircraft safety. From a majority of SR-14, views will be periodic as the road is curvy, the line will be above the road, and the varied terrain will block direct continuous views of towers.

Views from the Columbia River will be middle and background views, where boats will cross under the river crossing or viewing the line on the bluffs of the Oregon side, or as it follows the Columbia Hills on the Washington side. Views will only be somewhat affected because the line will have the backdrop of the hills, two transmission lines are already present, and wind turbines dominate the visible landscape just outside the NSA to the northeast.

Please refer to the photo simulations 3-8 through 3-11 in the Final EIS for illustrations of visual impacts within the NSA. Note that while the locations of the river crossing structures have changed slightly after the completion of the photo simulations (Figure 3-8) in the Final EIS, these changes will not be significantly different at the distances used for the simulations.

Cumulative Effects

Past and present development and activities have cumulatively changed the visual landscape in the immediate project vicinity within the NSA by introducing man-made features and altering natural forms. These features include residential and commercial development; road and railway construction; transmission construction and operation; construction and operation of wind energy; The Dalles Dam construction; and airport construction and operation. Reasonably foreseeable future actions involving development will be expected to continue this trend.

The NSA analysis is based on views from identified areas within the Gorge that are affected by the transmission line and the additional actions affecting visual resources that can be seen from the same area. The southern portion of this transmission line will not be visible from the Columbia River, I-84, Wishram, Rowena Plateau, or State Highway 14. As the transmission line turns north to cross the Columbia River and cross the NSA, it becomes visible to those viewsheds listed above except Rowena Plateau. In terms of other cumulative actions that can be seen from the same locations, it is possible that the Summit Ridge Wind Project in northern Wasco County could be seen, along with wind projects in southern Klickitat County including Windy Point I and II, Windy Flats, and Linden Ranch.

CULTURAL RESOURCES

The four Columbia River treaty tribes (Confederated Tribes and Bands of the Yakama Nation [Yakama Nation], Confederated Tribes of the Warm Springs Reservation Of Oregon [Warm Springs], Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe) were consulted at the beginning of the project along with the Oregon and Washington State Historic Preservation Offices (SHPOs) for input regarding cultural resource inventories and methodology. Input was also solicited from the USFS regarding the methodology that will be employed within the NSA in order to make sure that the fieldwork and reporting would be consistent with their management plan.

Initial cultural resource surveys were conducted by Central Washington University. Staff from the Yakama Nation and Warms Springs participated in the surveys as appropriate. Each of the four tribes also conducted a study to identify significant tribal sites. The main purpose of the initial survey work was to provide information for use in the NEPA analysis. Reports from the initial round of fieldwork were submitted to the Washington and Oregon SHPOs, the four tribes, and the USFS for comment. Comments that were received were incorporated into the reports.

Additional inventory work focused on the transmission line and consisted of shovel testing high probability areas within the NSA consistent with the management plan and conducting surveys of areas that were not accessible because landowner permission was received subsequent to the initial inventory. Limited shovel testing was also conducted at the crossing locations independent of the larger inventory due to geotechnical testing. BPA also had received reports on traditional cultural properties from the Confederated Tribes of the Umatilla Indian Reservation, Yakama Nation, Nez Perce Tribe, and the Warm Springs.

A Programmatic Agreement (PA) was developed to address resolving eligibility and effects for archaeological sites and sites of religious and cultural significance to Indian tribes where eligibility and effects could not be resolved prior to implementing the project. The BPA, USFS, SHPOs, and tribes all had input on drafting the PA and the signatories include BPA, USFS, Washington and Oregon SHPOs, and the Advisory Council on Historic Preservation.

After construction began, the Yakama Nation, the Washington SHPO and the National Park Service raised concerns regarding effects on historic sites in the vicinity of the Washington river crossing. Although BPA had conducted an appropriate assessment and consultation regarding the project prior to issuing its decision to proceed, and could have proceeded with the project, BPA delayed construction at the Washington side of the river crossing to further investigate and evaluate the concerns raised.

Ultimately, following additional archaeological inventories and a second Yakama Nation traditional cultural property study, BPA determined that an additional cultural district and landscape are located within the project's area of potential effect. After the identification of the additional cultural resources within the project area, BPA has worked with consulting parties to minimize project disturbance to lands within these cultural areas. As such, BPA has worked with consulting parties to relocate structures from their previously-engineered locations to directly replace existing structures, reconfigured workspaces to minimize impacts, and redesigned access roads to minimize disturbance in sensitive areas.

As a result of the additional identified cultural resources, BPA has developed an amended PA to address avoidance, minimization and mitigation for effects on cultural resources within the portion of the project's area of potential effect that overlaps the newly-identified cultural sites.

NATURAL RESOURCES

Listed below are the locations where the Final EIS discusses the transmission line for each of the natural resources.

- Vegetation: Volume 1, pages 3-65 through 3-66, pages 3-73 through 3-74, and 7-7; Volume 2, Appendix B and D

- Geology and Soils: Volume 1, pages 3-80 through 3-81 and pages 3-83 through 3-84; Volume 2, Appendix J
- Water Resources and Wetlands: Volume 1, pages 3-91 through 3-92, pages 3-98 through 3-100, and 7-5 through 7-7; Volume 2, Appendix B
- Wildlife: Volume 1, pages 3-112 through 3-113, pages 3-117 through 3-119, and 7-7; Volume 2, Appendix B and D
- Fish: Volume 1, pages 3-123 through 3-126; Volume 2, Appendix D

Vegetation

Field surveys were conducted by a professional botanist to determine occurrences of rare plant species in August 2009, April 2010, and August 2010. In 2013, BPA also conducted an assessment for potential sensitive plant species habitat along the route of travel leading to the BNSF guard structure and the proposed guard structure location (line mile 8). No federally listed plants and no plant species on sensitive species list for the NSA and National Forest System have been found within 1,000 feet of the project right-of-way within the NSA, although suitable habitat is present in places for a large number of species on this list (see Appendix D of the Final EIS). Smooth desert-parsley has historically been located along the project right-of-way near Wishram (line mile 9), but was not found during field surveys. Also, no high-quality or state-priority vegetation communities were identified along the project route.

Geology and Soils

Within the NSA, the transmission line crosses a landslide area between line miles 9-10, which is a large landslide in the Columbia Hills north of Highway 14 above Wishram, Washington. This slide has deformed the highway in places, indicating portions of it are still moving. Where the transmission line will cross through the active landslide above Wishram, BPA will make maximum use of existing access roads, with short sections of new roads built to appropriate design standards for the terrain. The existing line in this corridor has had no history of landslides.

A detailed seismic and geologic hazard assessment conducted along the transmission line found no known active faults in the area. Faults discovered have a low-to-moderate probability of surface rupture; towers will be built to appropriate seismic standards. Along its entire length, the transmission line is expected to result in a soil erosion rate slightly higher than what will occur under natural conditions.

Water Resources and Wetlands

Within the NSA, minimum buffers are 200 feet for perennial or fish bearing streams (some of which can be intermittent) and 50 feet for intermittent, non-fish-bearing streams. The transmission line will cross the Columbia River between line miles 7 and 8. The stream/river and buffer zones will be spanned and will not be impacted by tower footings or access roads. No roads will be constructed, repaired, or maintained across any waterbodies or buffers. One route off travel leading to Tower 9/5 will cross an intermittent waterbody and associated buffer.

North of Tower 9/1, two access roads (access roads 8010 and 9010) will be repaired/maintained through a palustrine emergent wetland and its buffer. The wetland is a low quality wetland invaded with blackberries adjacent to cattle pens. The access road follows the terrain in the area and there are no wetland indicators on the existing road bed, which is used by BPA and the landowner. No new fill will be placed in the wetland and a culvert will be replaced to allow better water flow. Relocating the

road would be difficult given the terrain in the area and would require new impacts, cut and fill, and, given the large size of this wetland area, a relocated road would likely cross the wetland creating greater impacts than using the existing road bed.

Between Towers 9/2 and 9/3, the same access road (access road 9010) will be constructed within the buffer zone of the above discussed palustrine emergent wetland. This is a low quality wetland in a ravine with the buffer zone in upland areas. It is not practicable to relocate the road in this topography as it would create much greater impacts than using the existing road bed.

Wildlife

Field surveys were conducted by professional wildlife biologists to determine occurrences of wildlife species in August 2009 and April 2010. Either no suitable habitat or no documented occurrences of federally listed wildlife species were found in the project right-of-way within the NSA. The peregrine falcon, a federal species of concern, has been found along the Columbia River near the right-of-way. In addition, five species (including peregrine falcon) on the sensitive species list of the NSA and National Forest System have been documented in the project area, although suitable habitat is present in places for a large number of species on this list as well (see Appendix D of the Final EIS). The five documented sensitive species include bald eagle, ferruginous hawk, peregrine falcon, golden eagle, and merlin. Sitings have primarily been of raptor nests in the cliff and rock outcrop habitats along the banks of the Columbia River. These include a peregrine falcon nest documented north of the project route on the south bank, four falcon eyries on the south and north banks, an unoccupied and unidentified raptor nest on the north bank of the Columbia River. All identified active bird nests are more than 0.25 mile from the currently proposed work areas and nesting activities will not be disturbed by construction.

No trees will be removed within the NSA. The line was designed to span orchards and riparian areas that are located in incised ravines. Other sensitive wildlife areas of potential conservation concern in the NSA include WDFW priority habitat (cliffs) and ODFW strategy habitats (grassland, riparian areas, wetlands, and aquatic habitats). No cliff habitat will be impacted by tower footings or roads, although transmission lines spanning the cliffs will present a small risk of collisions for raptors. Waterfowl using the open water habitat of the Columbia River could potentially collide with the transmission line spanning these areas, but bird diverters that will be placed on the ground wires will mitigate this risk.

For species that could occur in the right-of-way, construction activities could result in temporary displacement and disturbance. Disturbances will include noise from heavy equipment, helicopters, blasting, explosive fittings, vehicles, and humans. Where ground disturbance occurs, most invertebrates in the grassland/shrub-steppe and rock outcrops crossed, will not typically move great distances to avoid construction activities. For these species, construction could disrupt foraging, breeding, and other normal activities, as well as cause direct physical impacts and remove habitat since they are relatively immobile. For more mobile species, displacement both within and near construction sites will occur but will be temporary. On cliffs or rock outcrops, lizards and snakes will likely move during construction. However, where blasting or drilling is required, an increase in potential direct impacts to reptiles in the vicinity will occur. Typical operations and maintenance impacts on wildlife, which will include limited periodic noise and truck traffic, will be much less than construction impacts and will be brief and minimally invasive.

Fish

Federally protected fish species and species on the sensitive species list for the NSA and National Forest System are present in the project area in portions of the Columbia River. However, no in-water work will be done in the river, and the project will not directly alter fish habitat or require culverts in other fish-bearing streams.

Few to no impacts on fish and fish habitat could result from the use of the route of travel that will cross a small, intermittent streams, which may support fish seasonally, but is dry for most of the year (based on stream typing from Washington's Interim Water Typing System [WAC 222-16-031]). No culverts or instream work is proposed for this route of travel; therefore, the route's use should have little to no effect on fish or their habitat.

PROJECT MITIGATION

Listed in the table below are all identified project mitigation features contained in the project's Record of Decision. Additional project mitigation measures resulting from the project's amended PA have been added in italics under the cultural resources section.

Mitigation Measures	Time of Implementation
Land Use and Recreation	
• Provide a schedule of construction activities to all landowners that could be affected by construction.	Prior to construction
• Limit construction to daylight hours, minimizing disturbance to those residents who work during the day.	During construction
• Compensate landowners for any new land rights required for right-of-way or access road easements.	Prior to construction
• Compensate landowners for any damage to property during construction.	During and after construction
• Compensate landowners for reconfiguration of irrigation systems due to placement of towers or access roads.	After construction
• Restore compacted cropland soils as close as possible to preconstruction conditions using tillage.	After construction
• Do not allow mixing of excavated material with topsoil outside of tower footprint on farms or croplands.	During construction
• Work with landowners to determine mitigation measures needed to maintain Conservation Reserve Program (CRP) status, if needed.	Prior to, during, and after construction
• Follow applicable goals and objectives of the National Scenic Area Management Plan with guidance from the U.S. Forest Service (USFS) and Columbia River Gorge Commission (CRGC) in the Columbia River Gorge National Scenic Area (National Scenic Area).	During design and prior to, during, and after construction
• Reseed disturbed areas (see mitigation measures in Vegetation).	After construction
• Implement measures to reduce the possible spread of noxious weeds (see mitigation measures in Vegetation).	Prior to, during, and after construction
• Implement measures to control dust (see mitigation measures in Geology and	During construction

Mitigation Measures	Time of Implementation
Soils)	
• Implement measures to control construction noise (see mitigation measures in Noise).	During construction
• Install gates, barriers, and postings at appropriate access points at the landowner's request, to minimize or eliminate public access to project facilities.	During and after construction
Visual Resources	
• Site all construction staging and storage areas away from locations that will be clearly visible from sensitive scenic areas, trails, and scenic highways as much as practical.	During construction
• Treat galvanized steel towers and transmission line conductors to dull the shininess of the steel	Prior to construction
• Implement construction site maintenance and clean-up. Keep construction areas free of debris.	During and after construction
• Provide regular maintenance of access roads and gates within and leading to the corridor.	After construction
• Reseed disturbed areas (see mitigation measures for Vegetation).	After construction
• Implement measures to reduce the possible spread of noxious weeds (see mitigation measures in Vegetation).	Prior to, during, and after construction
• Implement measures to control erosion and dust (see mitigation measures in Geology and Soils, and Air Quality).	During and after construction
Vegetation	
• Locate towers and roads outside of priority ecosystems, high-quality vegetation communities, and areas of special-status plants as much as possible. Avoid these areas during construction (staging areas, pulling sites, etc.).	During design and construction
• Avoid tree removal to the extent possible.	During design and prior to and after construction
• Cut or crush vegetation rather than blade in areas that will remain vegetated to maximize the ability of native plants to resprout.	During construction
• Work with the appropriate state agency to mitigate impacts to federal species of concern, state-listed species, or protected habitats if impacts are unavoidable. Site-specific mitigation to be determined after a project decision is made and during tower location and design. Measures could include the following: ➢ Ecologically optimizing siting of facilities ➢ Special construction techniques to minimize soil disturbance ➢ Seasonal restrictions ➢ Identifying and securing replacement lands ➢ Identifying appropriate seed or plant sources for revegetation ➢ Monitoring and response provisions.	During design and prior to, during, and after construction
• Seed all disturbed areas to prevent colonization by weeds and facilitate reestablishment of the preconstruction plant community. Use native seed mixtures that consist of locally dominant native species, unless requested	After construction

Mitigation Measures	Time of Implementation
differently by the landowner. On CRP lands, use native seed mixtures approved by the local Farm Service Agency (FSA).	
• Restore compacted soils if needed prior to seeding (see mitigation measures in Land Use).	After construction
• Prepare and implement an Early Detection Rapid Response Plan to control the infestation or spread of noxious weeds that will include the following measures: ➢ Collaborate with the Klickitat County Weed Board or Wasco County Weed Department and landowners to determine and carry out the best control measures deemed locally effective for weed control during construction and over the life of the line. ➢ Conduct invasive weed surveys prior to and following construction to determine potential weed spread and appropriate corrective actions. ➢ Where possible, treat identified infestations prior to construction. Pressure or steam wash vehicles and other equipment that have been in weed-infested areas at established wash stations upon leaving the infested areas to prevent spreading weeds to uninfected areas during construction. Monitor and treat existing and new infestations during construction on a minimum annual basis and for 3 years after construction.	Prior to, during, and after construction
• Equip all vehicles with basic fire-fighting equipment, including extinguishers and shovels to prevent fires that could encourage weed growth.	Prior to and during construction
• Use certified weed-free mulch, if mulch is used for erosion control.	During and after construction
Geology and Soils	
• Minimize the project ground disturbance footprint, particularly in sensitive areas (i.e., steep slopes and landslide areas).	During design and construction
• Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction activities to lessen soil erosion and improve water quality of stormwater runoff.	Prior to, during, and after construction
• For the SWPPP, use management practices contained in the Storm Water Management Manual for Eastern Washington (e.g., use silt fences, straw bales, interceptor trenches, or other perimeter sediment management devices; place them prior to the onset of the rainy season and monitor and maintain them as necessary throughout construction).	Prior to, during, and after construction
• Prepare a Fugitive Dust Control Plan to control dust.	Prior to construction
• Water or use palliatives on exposed soil surfaces in areas disturbed during construction.	During construction
• Water, use palliatives, or cover construction materials if they are a source of blowing dust.	During construction
• Gravel access road surfaces in areas of sustained wind and potential dust erosion.	During construction
• Ensure construction vehicles travel at low speeds on access roads and at construction sites to minimize dust.	During construction

Mitigation Measures	Time of Implementation
• Limit the amount of time soils are left exposed.	During and after construction
• Reseed disturbed areas (see mitigation measures in Vegetation).	After construction
• Restore compacted soils (see mitigation measures in Section 3.1 Land Use).	After construction
• Conduct additional site-specific evaluations in areas of potential landslides to determine degree of recent activity, likelihood of activation or reactivation, potential setbacks, and site-specific stability as appropriate.	During design
• Design roads to limit water accumulation and erosion; install appropriate access road drainage (ditches, water bars, cross drainage, or roadside berms) to control and disperse runoff.	During design and construction
• Design transmission tower footings and roads for specific site conditions through detailed geologic hazard assessments, including review of geologic maps and aerial photography, surface condition assessments, and geological testing at representative sites.	During design
• Minimize construction on steep or unstable slopes, if possible.	During design and construction
• Relocate towers or roads located within previously unidentified active slides, bedrock hollows, or other geologic hazard areas, where possible.	During design
Water Resources and Wetlands	
• Minimize the project ground disturbance footprint, particularly in sensitive areas such as stream crossings and wetlands, and stream and wetland buffers.	During design and construction
• Develop and implement a Spill Prevention, Control, and Countermeasure Plan to minimize the potential for spills of hazardous material, including provisions for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols.	Prior to and during construction
• Prepare and implement a SWPPP (see mitigation measures in Geology and Soils) to improve water quality of stormwater runoff.	Prior to, during, and after construction
• Prepare to manage dewatering, including proper disposal of drilling fluids and mud away from wetlands or surface waters.	Prior to and during construction
• Prepare for management of excess concrete.	Prior to and during construction
• Remove and dispose of sediment properly, away from wetlands or surface waters.	During construction
• Install culverts for access roads in the dry season or during low-flow conditions if possible to minimize sediment delivery to streams.	During construction
• Limit tracking of soil onto paved roads by gravelling road approaches, washing vehicle wheels, and cleaning mud and dirt from paved roads to reduce sediment delivery to roadside ditches and nearby streams.	During construction
• Avoid use of heavy equipment and vegetation removal in wetlands and wetland buffer zones to avoid soil compaction, destruction of live plants, and potential alteration of surface water patterns. Use track equipment or matting, if appropriate.	During construction

Mitigation Measures	Time of Implementation
• Avoid placing staging areas in wetlands or stream buffers.	Prior to and during construction
• Avoid placing new access roads through wetland complexes around the Columbia River, Fifteenmile Creek, Little Klickitat River, Spring Creek, Swale Creek, and Blockhouse Creek to minimize the potential for altering surface water patterns and isolating connected wetlands.	During design and construction
• Obtain all appropriate permits with approved wetland delineations and compensatory mitigation plans prior to construction as needed.	Prior to construction
• Use high-visibility fencing around wetland buffer zones to avoid inadvertent activity (e.g., parking and driving) in wetlands or buffers or streams.	During construction
• Reseed disturbed areas (see mitigation measures in Vegetation).	After construction
Wildlife	
• Minimize the project ground disturbance footprint, particularly in special-status areas such as priority habitats, which can include riparian areas, wetlands, and grassland/shrub-steppe.	During design and construction
• Avoid tree removal to the extent possible.	During design and prior to and after construction
• In locations where nests for special-status species have been identified, determine construction schedules through consultation with Washington Department of Fish and Wildlife or Oregon Department of Fish and Wildlife to avoid breeding season disturbance. The following mitigation schedules will be implemented where possible: Peregrine falcon—avoid construction activities within 0.25 mile of any active nests during the breeding season (February 1 through July 15 or until young have fledged). Prairie falcon—avoid construction activities within 0.25 mile of any active nests during the breeding season (March 1 through July 30 or until young have fledged). Bald eagle and golden eagle—avoid construction activities within 0.25 mile of active nests during the breeding season (January 1 through August 31 or until young have fledged).	Prior to and during construction
• Install bird diverters on overhead ground wires in high risk areas (over river and stream crossings and near wetlands).	During construction
• Prepare and implement a SWPPP and a Spill Prevention, Control, and Countermeasure Plan (see mitigation measures for Geology and Soils and Water Resources and Wetlands) to protect wetland habitats.	Prior to, during, and after construction
• Reseed disturbed areas (see mitigation measures for Vegetation).	After construction
• Prepare for fire control (see mitigation measures for Vegetation) to protect habitats.	Prior to and during construction
• Work with the appropriate state agencies to mitigate impacts to federal species of concern, state-listed species, or protected habitats if impacts are unavoidable (see mitigation measures for Section 3.3 Vegetation).	During design and prior to, during, and after construction

Mitigation Measures	Time of Implementation
Fish	
• Minimize the project ground disturbance footprint, reseed disturbed areas, and install culverts during the dry season (see mitigation measures for Vegetation and Water Resources and Wetlands) to limit sedimentation affecting fish habitat.	During design and construction, and after construction
• Prepare and implement a SWPPP and a Spill Prevention, Control, and Countermeasure Plan (see mitigation measures for Geology and Soils and Water Resources and Wetlands) to protect fish habitat.	Prior to, during, and after construction
• Avoid blasting within 200 feet of fish-bearing streams.	During construction
Cultural Resources	
• Locate transmission line towers and access roads to avoid cultural resources, where possible.	During design
• Use existing access roads where possible to limit possibility of new disturbances.	During design and construction
• Consult with the Washington State Department of Archaeology and Historic Preservation (DAHP) or Oregon State Historic Preservation Office (SHPO), as applicable; the Advisory Council, the Confederated Tribes of the Warm Springs Reservation of Oregon; the Confederated Tribes and Bands of the Yakama Nation, the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation; state agencies (if sites found on state lands); and the USFS (if sites found on USFS land or within the National Scenic Area) regarding National Register of Historic Place (NRHP) eligibility of cultural resources. • *Implement mitigation measures agreed-upon through consultation and committed to in the programmatic agreement.*	During design and construction
• Develop an Inadvertent Discovery Plan that details crew member responsibilities for reporting in the event of a discovery during construction. This plan should include directives to stop work immediately and notify local law enforcement officials (if appropriate), appropriate BPA personnel, Tribes, USFS (if appropriate), and the Washington DAHP or Oregon SHPO if cultural resources are discovered.	Prior to construction
• Ensure cultural resource monitors are present during construction in the area of known cultural resources to monitor sites during excavation and to prevent unauthorized collection of cultural materials.	Prior to and during construction
• *Redesign of project in mile 8 and 9 to reduce total number of towers needed by one.*	Prior to construction
• *Shift location of tower 8/1 twenty feet to minimize impacts.*	Prior to construction
• *Redesign access roads for miles 8 and 9 to minimize ground disturbance and to reduce total length or <u>permanent</u> access roads by approximately 2000 feet.*	Prior to construction
• *Restoration of sites to pre-disturbance condition.*	Post construction
Socioeconomics	
• Compensate landowners at market value for any new land rights for right-of-way or access road easements.	Prior to construction
• Compensate landowners for damage to property or crops during construction or	During and after

Mitigation Measures	Time of Implementation
operation and maintenance activities, as appropriate.	construction
• Compensate landowners for irrigation systems that must be reconfigured to accommodate new transmission infrastructure.	Prior to, during, and after construction
• Consult with the Natural Resource Conservation Service (NRCS) and FSA to mitigate impacts to CRP land to maintain existing CRP status of lands and federal payments to landowners, where practicable (see mitigation measures in Vegetation).	Prior to, during, and after construction
• Prepare for fire management (see mitigation measures in Vegetation).	Prior to and during construction
Transportation	
• Coordinate with Klickitat County roads department for upgrades of county roads.	Prior to and during construction
• Coordinate routing and scheduling of construction traffic with state and county road staff, Columbia River operators, and railroad operators.	Prior to and during construction
• Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for short interruptions of traffic.	During construction
• Conduct regular maintenance on access roads and gates within and leading to the corridor.	Prior to, during, and after construction
• Prepare and implement a SWPPP (see mitigation measures in Geology and Soils) to prevent sediments from being transported onto adjacent roadways.	Prior to, during, and after construction
• Limit tracking of soil onto paved roads (see mitigation measures in Geology and Soils).	During construction
• Design roads to limit erosion (see mitigation measures in Geology and Soils).	During design
• Restore public roadways to preconstruction conditions upon completion of project construction activities.	After construction
• Coordinate with the Washington State Department of Transportation (WSDOT) Aviation Division and comply with Federal Aviation Administration (FAA) regulations for marking or lighting (including lighting towers and installing marker balls on overhead ground wires in specific locations).	Prior to and during construction
Noise	
• Ensure standard sound-control devices, including mufflers, are on all construction equipment and vehicles.	Prior to and during construction
• Limit construction activities to daytime hours.	During construction
• Notify landowners located along the corridor prior to construction activities, including blasting.	Prior to construction
Public Health and Safety	
• Notify landowners located along the corridor prior to construction activities, including blasting.	Prior to construction
• If blasting is required, take appropriate safety measures and follow all state and local codes and regulations. Lock up or remove all explosives from work sites at	Prior to and during construction

Mitigation Measures	Time of Implementation
the end of the workday.	
• Hold crew safety meetings at the start of each construction workday to review potential safety issues.	During construction
• Prepare and implement a Spill Prevention, Control, and Countermeasure Plan (see mitigation measures in Water Resources and Wetlands) to manage hazardous materials and respond to emergency situations.	Prior to construction
• Prepare and maintain an on-site safety plan in compliance with state requirements.	Prior to construction
• Prepare for fire control (see mitigation measures in Vegetation).	Prior to and during construction
• Fuel all highway-authorized vehicles off-site to minimize the risk of fire. Fueling of construction equipment that is transported to the site via truck and is not highway authorized will be done in accordance with regulated construction practices and state and local laws. Helicopters will be fueled and housed at local airfields or at staging areas.	During construction
• Secure the site at the end of each workday to protect equipment and the general public.	During construction
• Ensure that BPA contractors flying helicopters prioritize public safety during flights. For example, establish flight paths to avoid populated areas or schools (Helicopter Association International 1993).	During construction
• Implement appropriate airport safety measures (see mitigation measures in Transportation).	Prior to construction
• Clear vegetation according to BPA standards to avoid contact with transmission lines prior to project construction and throughout the life of the line.	Prior to, during, and after construction
• Prepare and implement a lead abatement plan that will cover removal and disposal of any contaminated paint chips in accordance with applicable federal, state, and local environmental and safety standards.	Prior to construction
• Report possible hazardous materials, toxic substances, or petroleum products discovered along the transmission line route that will pose an immediate threat to human health or the environment, including large dump sites, drums of unknown substances, suspicious odors, stained soil, etc.	Prior to, during, and after construction
• Adhere to appropriate specifications for grounding fences and other objects on and near existing and new rights-of-way.	Prior to, during, and after construction
• Design, construct, and operate the new transmission line according to the National Electric Safety Code (NESC).	Prior to, during, and after construction
• Restore reception quality if radio or television interference occurs as a result of constructing the transmission line so that reception is as good as or better than before the interference.	After construction

Mitigation Measures	Time of Implementation
Air Quality	
• Prepare and implement a SWPPP (see mitigation measures in Geology and Soils) to limit erosion and dust generation.	Prior to, during, and after construction
• Prepare a Fugitive Dust Control Plan to control windblown dust (see mitigation measures in Geology and Soils).	Prior to construction
• Reseed disturbed areas (see mitigation measures in Vegetation) to prevent dust from erosion.	After construction
• Shut down idling construction equipment, if feasible.	During construction
• Ensure all vehicles are in compliance with applicable federal and state air quality regulations for tailpipe emissions. Certification that vehicles meet applicable regulations will be provided by contractors to BPA in writing.	Prior to construction
• Maintain and certify in writing that all construction equipment is in proper working condition according to manufacturer's specifications.	Prior to construction
• Obtain rock and concrete from sources with appropriate environmental permits.	Prior to and during construction
Greenhouse Gases	
• Implement vehicle idling and equipment emissions measures (see mitigation measures in Air Quality).	Prior to, during, and after construction
• Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.	Prior to and during construction
• Locate all staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.	During design and construction
• Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.	During design and construction
• Use the proper size of equipment for the job.	During construction
• Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power where practicable.	During construction
• Reduce electricity use in the construction office by using compact fluorescent bulbs, and powering off computers every night.	During and after construction
• Recycle or salvage non-hazardous construction and demolition debris to the maximum extent practicable.	During and after construction
• Submit a plan for approval to dispose of wood poles locally where practicable.	Prior to construction
• Use locally sourced rock for road construction, if possible.	During construction